



Peripheral Vasopressors for Shock—More Evidence to Do Less

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Interest in the use of peripheral intravenous (PIV) catheters to administer vasoactive medications to patients in shock has grown in recent years. Potential benefits include faster shock reversal as well as avoidance of central venous catheters (CVCs) to decrease complications related to placement and line-associated infections. The latest Surviving Sepsis Campaign guidelines even suggest using peripheral vasopressors rather than delaying vasopressor initiation until CVC placement,¹ though it is a weak recommendation based on low-quality evidence. To update the evidence base, ZhangJian et al² conducted a systematic review and meta-analysis on the outcomes of peripheral vasopressor use.

ZhangJian et al² identified 49 studies (including 33 060 PIV catheters) of critically ill adult patients receiving peripheral vasopressors in a variety of hospital settings, with the primary goal of identifying adverse events (AEs).² Secondly, they sought to identify the rate of CVC avoidance. The pooled rate of minor AEs (such as injection site pain, swelling, extravasation, and cellulitis) was low at 2.6%. Major AEs were even less frequent at 1.4%, largely due to venous thromboemboli associated with midline catheters, with only 1 tissue necrosis event identified. Notably, there was a higher rate of observed minor complications in prospective compared with retrospective studies, which is not unexpected given likely differences in rigor of monitoring. CVC avoidance across studies was significantly heterogenous, with a pooled proportion of about 60%. The authors attributed this heterogeneity to study-level differences in protocols and resources.

To my knowledge, there are no multicenter randomized clinical trials comparing CVC with PIV administration of vasoactive medications. However, given that CVCs are associated with a 3% risk of major complications³—twice the rate of major AEs found in the study by ZhangJian et al²—these findings may prompt clinicians to consider use of PIVs for vasoactive drugs in critically ill patients. Several technical and system-based factors must be considered. The majority of vasoactive medications in ZhangJian and colleagues² review were catecholamines, which have well-established reversal agents (such as phentolamine) for tissue extravasation.⁴ Reversal agent efficacy is less clear for medications such as vasopressin and angiotensin II, the latter of which was not included in ZhangJian and colleagues² study. One also needs to consider what maximal vasopressor dose might be delivered via PIV, with higher doses possibly increasing the risk of extravasation injury as well as the risk of hemodynamic collapse should the PIV fail. This emphasizes the need for a back-up PIV in the situation of primary PIV failure, along with careful consideration of how and where the PIV is placed. Uncertainty also remains as to whether a traditional PIV vs midline catheter should be favored, a choice that requires more data to clarify, in addition to a consideration of hospital- and patient-based factors. None of this is possible without clear systems of care, including protocols for ongoing monitoring, addressing AEs, and determining when escalation to CVC is necessary.^{5,6}

In some ways, administering vasoactive medications via PIV requires us to do more (frequent monitoring, safety checks, practice changes, etc) in order to do less (CVC placement), which is a common issue in medical minimalism.⁷ However, ZhangJian and colleagues² have demonstrated that PIV administration of vasopressors likely can be accomplished safely, with perhaps less discomfort and harm, compared with conventional CVC-based approaches in some critically ill patients.

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